

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam San Joaquin Dam No. 1029 County Orange
Type of Dam Earth Type of Spillway 2 - Drop Box Inlets
Water is 21.4 feet below spillway crest and 26.9 feet below dam crest.

Weather Conditions Cool, light precipitation

Contacts Made Steve Habiger & Tyler Dillman with IRWD; Doug Harriman & Will Kulikowski with Genterra

Reason for Inspection Annual Maintenance Inspection

Important Observations, Recommendations or Actions Taken

1. Clear the grove of woody vegetation near the right downstream toe by November 1, 2018.
2. Monitoring of the "low spot" below the Downstream El. 420 Bench can be discontinued.

Conclusions

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for continued use.

Observations and Comments

Dam

This is a sizeable zoned earthen embankment consisting of a thin impervious zone on the upstream slope, backed by a filter-drain blanket that reverses direction at the bottom. The reservoir stores reclaimed water. The AC paved crest and curbs were well aligned and reasonably level, with no indication of embankment distress. The highly weathered asphalt paved upstream slope was relatively uniform and revealed no indication of slope instability. The upstream AC liner serves only for erosion control and not as an impervious liner. The downstream slope contains three mid-level benches which were traversed. No detrimental conditions were observed. The "low spot" on the downstream slope, located just below the "El. 420 bench" near the right abutment, was explained by Genterra as having likely been caused by reconstruction of the bench (widening and re-shaping of the curve), whereby the spoil materials were pushed over the bench, causing an overly-steepened slope below the bench. The riprap originally on the slope was buried by the dumped spoil material, giving the appearance that the riprap was missing. This explanation reasonably matched my observations. This "low spot" was first noted in a 12/29/94 Inspection Report, which indicated this was a "longstanding condition". Subsequent annual monitoring has indicated no changes since. This spot is located above the coarse (12" minus) pervious embankment zone, expected to have negligible pore pressures. Combined with the absence of indications from the dam surveillance program, it is my opinion that this "low spot" is not a developing sinkhole, soil creep, or local slide in progress. As such, it is my recommendation that further monitoring of this "low spot" be discontinued. Rodent and vegetation control was satisfactory overall, except for a grove of woody vegetation on the dam near the right abutment at the bottom of the downstream slope. It is left of the right-groin. Mr. Habiger agreed to have that area cleared (see photograph below).

Spillway

The two drop box inlet spillways were open and clear. The concrete was in good condition. The entrances to the two 48-inch RCP conduits were clear. The exit at the dissipater structure was reasonably clear.

Outlet

Upstream outlet controls consist of a 24-inch, a 60-inch, and three 48-inch butterfly valves located on the slope of the reservoir at various levels, with pneumatic controls from a structure adjacent the

Photos taken? Yes X No _____
cc for Owner/Book

Electronic Signature:
Philip Lee, P.E.
Safety of Dams
9/5/2018; 2:56 pm

Inspected by PW Lee
Date of Inspection 5/2/2018
Date of Report 5/22/2018

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Name of Dam San Joaquin Reservoir

Dam No. 1029-0

Date of Inspection 5/2/2018

Observations and Comments

	reservoir perimeter road. In addition, there are two 18-inch in-line butterfly blowoff valves controlled from within a "confined space" vault right of the downstream toe. All five upstream valves were fully cycled satisfactorily. The two downstream 18-inch blowoff valves were not cycled, as the necessary valve stem extension and/or confined space access provisions were unavailable during this inspection. Preparation should be made to cycle these valves on the next inspection.		
<u>Seepage</u>	There was no evidence of seepage on the downstream groins, slopes, or toe. The weir readings were as follows:		
	East 36.6 gpm	Floor	5.78 gpm
	West 39.1 gpm	U/S Collector 1	Dry
	Filter 7.24 gpm	U/S collector 2	Dry
	Toe 1.61 gpm	6/16/08 Flowpoint	Dripping
	Collection of "black sediment" (fines containing organics and clay) continues to be monitored in the East, West, and Filter weir boxes, located in the "confined space" vault. Sediment was first noticed in 2010; and monitoring began in April 2014. Genterra's 2017 Surveillance Report indicates that as of April 2014, sediment collected in the East Drain and Filter Drain have since diminished, but sediment continues to appear in the West Drain weir box, varying from 1.85 to 8.71 pounds per monthly recording, averaging 2 to 3 pounds per month. The amount is linked to reservoir head and seepage flow. For reference, the East Drain collects seepage from under the eastern toe of the reservoir basin slope; the West Drain collects seepage under the reservoir floor; and the Filter Drain collects seepage along the toe of the "El. 300 Bench" on the downstream slope of the dam.		
<u>Instr.</u>	Instrumentation at this dam includes 20 pneumatic piezometers, 6 open well piezometers, 8 vibrating wire piezometers, 8 monitoring wells, 7 seepage points, 33 intact survey monuments, a rain gage, and reservoir level staff gages along the slope. The most recent surveillance report submittal by Genterra was dated August 14, 2017 and included data through December 2016. I reviewed this report and found that all water and movement measurements for this reporting period were within the boundaries of historical norms. No abnormal trends were observed. Survey Monument SC-8, positioned on the bench where the "low spot" is located, has shown essentially no settlement or horizontal movements indicative of detrimental conditions. Based on this review, the dam is performing satisfactorily. No additional instrumentation is judged necessary at this time.		
<u>Other</u>	The internal zoning configuration of this dam places the impervious zone within the upstream slope and includes an extended (reverse directional) path for the drain blanket to dissipate excess pore pressures. This is evidenced by piezometric plots showing lingering excess pore pressures when the reservoir is dropping. This design makes the upstream slope vulnerable to rapid drawdown failure, evidenced by multiple historical failures of the upstream slope and liner. As such, reservoir evacuation must follow a gradual timed regimen to preclude rapid drawdown failure (Genterra, 2012). This information should be considered in the event of an incident requiring emergency drawdown.		

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Crest



Upstream Slope

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Downstream Slope



Grove of woody vegetation near the downstream toe near the Right Abutment (should be cleared)

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Left Downstream Groin.



Previously noted "Low Spot" below the "El. 420 bench"

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Another view of the “Low Spot”



(2) – Drop Box Inlet Spillways

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Entrance to 48" RCP at Bottom of Right Drop Box Inlet Spillway



Spillway Impact Dissipater (Exit) Structure